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10/777,957	02/13/2004	Paul Shirley	303.774US2	7102

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EXAMINER

CARRILLO, BIBI SHARIDAN

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1746

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**BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES**

Application Number: 10/777,957  
Filing Date: February 13, 2004  
Appellant(s): SHIRLEY ET AL.

**MAILED**

APR 18 2006

**GROUP 1700**

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Richard Billion  
For Appellant

**EXAMINER'S ANSWER**

This is in response to the appeal brief filed 2/8/2006 appealing from the Office action mailed 6/2/2005.

**(1) Real Party in Interest**

A statement identifying by name the real party in interest is contained in the brief.

**(2) Related Appeals and Interferences**

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

**(3) Status of Claims**

The statement of the status of claims contained in the brief is correct.

**(4) Status of Amendments After Final**

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

**(5) Summary of Claimed Subject Matter**

The summary of claimed subject matter contained in the brief is correct.

**(6) Grounds of Rejection to be Reviewed on Appeal**

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

**(7) Claims Appendix**

The copy of the appealed claims contained in the Appendix to the brief is correct.

**(8) Evidence Relied Upon**

No evidence is relied upon by the examiner in the rejection of the claims under appeal.

Art Unit: 1746

5,330,577	MAEDA ET AL.	7-1994
5,557,874	SU ET AL.	4-1996
5,364,144	SATTERFIELD ET AL.	11-1994
JP10-294261	HIDESHI AKUNE	11-1998
6,062,240	SADA ET AL.	05-2000

**(9) Grounds of Rejection**

The following ground(s) of rejection are applicable to the appealed claims:

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148

USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
  2. Ascertaining the differences between the prior art and the claims at issue.
  3. Resolving the level of ordinary skill in the pertinent art.
  4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation

Art Unit: 1746

under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

**It should be noted that the correct inventor name for the prior art of JP 10-294261 is Hideshi Akune, based on the translation of the JP document, instead of Akune, Shuji. Previous Office Actions and Appellant's Reply Brief cited the inventor as "Shuji". This is a typographical error based on the Abstract of the JP document. The JP document and all arguments, as set forth herein, will now refer to the teachings of Akune instead of Shuji.**

4. Claims 34-39 and 55-62 are rejected under 35 U.S.C. 103(a) as being unpatentable over Akune (JP10-294261) in view of Maeda et al. (5330577), as evidenced by Sada (6062240).

In reference to claims 33, 37, 55, 58, and 62, Akune teaches washing the revolving front face of a spin chuck 11 with a rotating brush 51. Akune teaches moving the brush in the vertical and horizontal direction by drive unit 53 which is operated by a controller. Akune fails to teach vacuuming the contaminants through a cleaning head assembly.

Maeda et al. teach cleaning semiconductor fabrication equipment using brushes 20 having a suction duct 19 for removing contaminants from the surface (col. 3, lines 15-47). It would have been obvious to a person of ordinary skill in the art to have modified the brush of Akune to include a suctioning duct for purposes of removing

Art Unit: 1746

contaminants during the cleaning process. In reference to claims 34-36 and 56-57, Akune teaches moving the brush in the vertical and horizontal direction. In reference to claims 38-39, it is notoriously well known in the art that chucks are made out of conventional materials, such as steel, as evidenced by Sada et al. in col. 4, lines 20-23.

5. Claims 40-41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Akune (JP10-294261) in view of Maeda et al. (5330577), as evidenced by Sada et al. (6062240), as applied to claims 34-39 and 55-62, as described in paragraph 4 above, and further in view of Su et al. (5507874).

Akune et al. fail to teach the material used in the manufacture of the chuck. Su et al. teach a method of cleaning a chuck. In col. 2, lines 30-31, Su et al. teach that various insulating coatings such as polytetrafluoroethylene, ceramic, or diamond are used. It would have been obvious and within the level of the skilled artisan to have modified the method of Akune to include conventional materials, as taught by Su et al., which are used in the manufacture of the chuck.

6. Claim 42 is rejected under 35 U.S.C. 103(a) as being unpatentable over Akune (JP10-294261) in view of Maeda et al. (5330577), as evidenced by Sada et al. (6062240), as applied to claims 34-39 and 55-62, as described in paragraph 4 above, and further in view of Satterfield et al. (5364144).

Akune fail to teach the material used in the manufacture of the chuck. Satterfield et al. teach a wafer handling apparatus made of acetal (col. 9, claim 6). It would have been obvious and within the level of the skilled artisan to have modified the method of

Art Unit: 1746

Akune to include conventional materials, such as acetal, as taught by Satterfield et al., which are used in the manufacture of the wafer handling apparatus.

**(10) Response to Argument**

- a) On page 10, lines 3-9 of the Appeal Brief, appellant argues that the prior art of Kipp fails to teach the claimed limitation. Applicant's arguments are unpersuasive since Kipp is not relied upon in the rejections as set forth above.
- b) Appellant argues that the skilled artisan would not look to a reference of Akune since Akune removes contaminants by jetting them off. Appellant's arguments are not persuasive since Akune teaches the desire to remove contaminants. The secondary reference of Maeda is relied upon to teach removing contaminants by vacuuming through a brush member 20b using a suction port 19b (Fig. 4).
- c) Appellant argues that the skilled artisan would not look to Akune since Akune introduces acetone into the clean environment. Appellant's arguments are unpersuasive since acetone serves as a cleaning solution to remove surface contaminants. Additionally, paragraph 26 of the translation teaches using other solutions as washing solutions.
- d) Appellant argues that the skilled artisan would not look to a reference that potentially introduces particles into the clean environment. Appellant's arguments are unpersuasive because they are not commensurate in scope with the instantly claimed invention. Paragraph 22 of the translation of Akune teaches washing the spin chuck and blowing gas for purposes of removing contaminants. Akune teaches the step of cleaning the spin chuck by applying a solution, scrubbing, and removing contaminants.

Paragraph 13 of the translation teaches washing the spin chuck in order to prevent contamination of the semiconductor surface. Any cleaning solution applied to the substrate surface introduces possibly a level of contamination onto the substrate surface due to certain factors such as the level of impurity present in the cleaning solution. However, Akune teaches removing the cleaning solution, along with surface contaminants for the added benefit of decreasing the amount of contaminants present on the semiconductor substrate.

e) Appellant argues that modifying Akune with Maeda would destroy the teachings of the primary reference. Appellant's argues that if the vacuum device of Maeda were **substituted** for the jet ports of Akune, 1) the main purpose of Akune of jetting the chuck with acetone and nitrogen gas would be destroyed, 2) no reasonable expectation of success would be achieved since pulling a vacuum through the jet ports of Akune would not work and 3) contaminant particles could plug the jet ports of Akune. Appellant's arguments are not persuasive since the examiner is not "substituting" the jet ports of Akune with the vacuum part of Maeda. The secondary reference of Maeda is relied upon to teach vacuuming contaminants through a brush assembly. The combination of Akune, as modified by Maeda results in the modification of the brush head 51 of Akune to include an additional vacuum port for removing contaminants. The modification of the brush head of Akune to include an additional port (i.e. vacuum port) for further removing contaminants, does not destroy the teachings of the primary reference.

f) Appellant argues that supplementing the jet port of Akune with the additional vacuum of Maeda compromises the jetting action of acetone and nitrogen since some of



the acetone and nitrogen will be vacuumed up. Appellant's arguments are unpersuasive since acetone as taught by Akune is used as a washing solution for scrubbing by brush 51. If acetone is jetted onto the surface and scrubbed, the additional modification of a vacuum would result in the vacuuming of the acetone and contaminants present in the solution and on the substrate surface. With respect to nitrogen, Akune teaches jetting nitrogen onto the surface in order to dry the surface and further remove contaminants. The addition of the vacuum to the device of Akune does not compromise the jetting action of the acetone and nitrogen since the vacuuming of Maeda serves as an additional means for further removing any remaining particles and contaminants present on the substrate surface. Since Akune teaches the desire to remove contaminants, a modification to the brush member to include an additional means of further removing contaminants, by vacuuming, does not comprise nor destroy the teachings set forth in the primary reference.

g) Appellant argues that one would not combine the teachings of Maeda with Akune since Maeda removes contaminants from an entirely different portion of a semiconductor fabrication apparatus, namely a gas manifold. Appellant's arguments are unpersuasive since the claims are only directed to cleaning a support. Appellant's arguments are unpersuasive since both references are directed to cleaning a substrate surface by scrubbing.

h) In reference to claim 55, Appellant raises the same arguments, which have been previously addressed above. Appellant further argues that the prior art fails to teach the limitations of claim 55. In reference to claim 55, Akune teaches a) providing a cleaning

Art Unit: 1746

surface (brush member 51 of Fig. 3 of Akune), removing a wafer from the support (i. e. spin chuck, paragraph 13 of the translation), moving the cleaning surface (i.e. element 51) in contact with the chuck (paragraph 22 of Akune) and removing contaminants (paragraph 22 of the translation). The secondary reference of Maeda is relied upon to teach vacuuming of the contaminants through the cleaning surface (i.e. brush member).

i) On Page 15 of the Reply Brief, Appellant states the following subheading:

***“4) Discussion of the rejection of claim 42 under 35 U.S.C. 103 (a) as being unpatentable over Shuji (JP10-294261) in view of Maeda et al. (U.S. Patent No. 5,330,577), as applied to claims 33-39 and 55-62, and further in view of Su et al. (U.S. Patent No. 5,5507,874).”***

This subheading is incorrect. Claims 40-41 are rejected as being unpatentable over Akune in view of Maeda and further in view of Su et al. The examiner considers this subheading as a typographical error since the discussion following the subheading is directed to claims 40-41 and since the “Grounds of Rejection to be Reviewed On Appeal”, as described on page 7 of the Appeal Brief is correctly stated.

j) On Page 16 of the Reply Brief, Appellant states the following subheading:

***“4) Discussion of the rejection of claims 34-39 and 55-62 under 35 U.S.C. 103 (a) as being unpatentable over Shuji (JP10-294261) in view of Maeda et al. (U.S. Patent No. 5,330,577), as applied to claims 33-39 and 55-62, and further in view of Satterfield et al. (U.S. Patent No. 5364144).”***

This subheading is incorrect. Claim 42 is rejected as being unpatentable over Akune in view of Maeda and further in view of Satterfield. The examiner considers this

Art Unit: 1746

subheading as a typographical error since the discussion following the subheading is directed to claim 42 and since the "Grounds of Rejection to be Reviewed On Appeal", as described on page 7 of the Appeal Brief is correctly stated.

k) No new arguments have been raised with respect to claims 40-42.

**(11) Related Proceeding(s) Appendix**

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.


For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

Sharidan Carrillo

Primary Examiner

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**SHARIDAN CARRILLO**  
**PRIMARY EXAMINER**

Conferees:

Roy King, SPE

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